

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
23 February 2006 (23.02.2006)

PCT

(10) International Publication Number
WO 2006/020728 A3

(51) International Patent Classification:
G01J 3/28 (2006.01)

52511 Geilenkirchen (DE). **REED, Joseph** [US/US]; 48 Tamarack Drive, Carversville, Pennsylvania 18913 (US).

(21) International Application Number:
PCT/US2005/028458

(74) Agent: **TONG, Kin-Wah**; 595 Shrewsbury Avenue, Shrewsbury, New Jersey 07702 (US).

(22) International Filing Date: 11 August 2005 (11.08.2005)

(81) Designated States (*unless otherwise indicated, for every kind of national protection available*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
10/916,762 12 August 2004 (12.08.2004) US

(71) Applicant (*for all designated States except US*): **DATA-COLOR HOLDING AG** [CH/CH]; Obegrundstrasse 110, CH-6002 Luzern (CH).

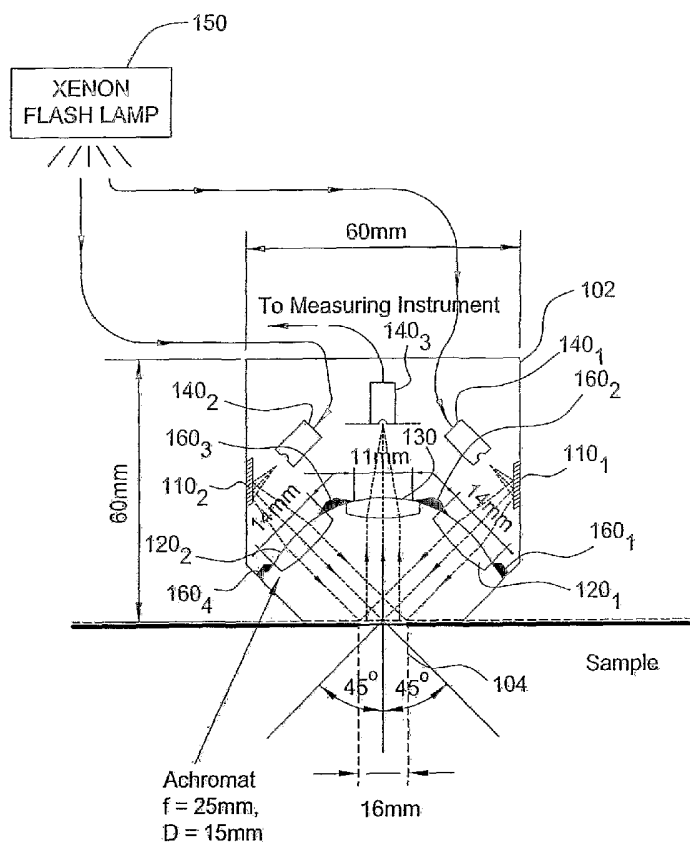
(72) Inventors; and

(84) Designated States (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT,

(75) Inventors/Applicants (*for US only*): **BROWN, Lawrence, B.** [US/US]; 16 Colton Drive, Cochranville, Pennsylvania 19330 (US). **INGLESON, Alan** [GB/GB]; 94 Turnpike Road, Newbury Berkshire RG14 2NF (GB). **KUBITZEK, Rudiger** [DE/DE]; Schwalbenweg 11,

[Continued on next page]

(54) Title: MEASURING HEAD FOR PLANAR MEASUREMENT OF A SAMPLE



(57) Abstract: A measuring head of the present invention conveys light from an external source through at least one optical fiber to at least one respective plane mirror inside the measuring head, where the light reflects through and is collimated by at least one collimating lens so as to be incident on a sample, in one embodiment, at an angle of substantially 45 degrees. The resulting optical path is folded once and thereby allows enough virtual space to redirect the light without excessive bending of the fibers. Light diffused from the sample is, in one embodiment, perpendicularly collected by a focusing lens, focused on the end of another optical fiber and directed outside of the measuring head to be used, for example, by a measuring instrument for the spectral analysis of the collected light.



RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA,
GN, GQ, GW, ML, MR, NE, SN, TD, TG).

(88) Date of publication of the international search report:
21 December 2006

Published:

— with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US05/28458

A. CLASSIFICATION OF SUBJECT MATTER

IPC: G01J 3/28(2006.01)

USPC: 356/326

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 356/326, 73.1,300-334; 353/326; 600/166, 178

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
NONE

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
Please See Continuation Sheet

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 6,008,905 A (BRETON et al) 28 December 1999 (28.12.1999) see entire document.	1-22
Y	US 4,881,811 A (O'BRIEN) 21 November 1989 (21.11.1989) see entire document.	1-22
Y	US 6,527,708 B1 (NAKAMURA et al) 28 December 1999 (28.12.1999) see entire document.	5
Y	US 6,119,031 A (CROWLEY) 12 September 2000 (12.09.2000) see entire document.	10, 11
Y	US 6,069,689 A (ZENG et al) 30 March 2000 (30.03.2000) see entire document.	13-15
Y	US 5,892,630 A (BROOME) 06 April 1999 (06.04.1999) see entire document.	16-18
Y	US 4,646,721 A (ARAKAWA) 03 March 1987 (03.03.1987) see entire document.	18

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

* Special categories of cited documents:		"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A"	document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E"	earlier application or patent published on or after the international filing date	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"I"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&"	document member of the same patent family
"O"	document referring to an oral disclosure, use, exhibition or other means		
"P"	document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search
17 August 2006 (17.08.2006)

Date of mailing of the international search report

19 SEP 2006

Name and mailing address of the ISA/US
Mail Stop PCT, Attn: ISA/US
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
Facsimile No. (571) 273-3201

Authorized officer

Jose Dees

Telephone No. 571-272-1569

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US05/28458

Continuation of B. FIELDS SEARCHED Item 3:
EAST; US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB; ((collimat\$3) adj optic) and measure, (colon adj2 scope)
sigmoldoscope endoscope.